

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference SNR07619WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/03134	International filing date (day/month/year) 22.07.2003	Priority date (day/month/year) 24.07.2002
International Patent Classification (IPC) or both national classification and IPC A41D13/05		
Applicant REMPLOY LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
  - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  17.02.2004	Date of completion of this report  02.09.2004
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Uhlig, R  Telephone No. +49 89 2399-7083 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB 03/03134

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1, 5-12 as originally filed  
2-4 received on 17.02.2004 with letter of 16.02.2004

**Claims, Numbers**

1-11 received on 17.02.2004 with letter of 16.02.2004

**Drawings, Sheets**

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	4
	No: Claims	1-3, 5-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**1. References**

Reference is made to the following documents cited in the international search report:

D1: US-A-3 044 075  
D2: US-A-4 641 641  
D3: US-A-6 093 468  
D4: US-A-2 889 830  
D5: US-A-5 836 015

**RE Item V**

**2. Independent Claim 1**

2.1 Based on the documents mentioned in the search report, the subject-matter of claim 1 - as far as understood - does not appear to at least involve an inventive step according to Article 33(1) and (3) PCT.

2.2 In terms of claim 1, D1 can be said to disclose (the references between inclined lines applying to this document),  
a pad for ~~use in~~ protecting the trochanteric region of the body /col. 1, line 13/  
comprising  
at least two separate layers (1, 2), /Fig. 1, refs. 1, 3 or 5/,  
a *substantially* rigid layer (1) /col. 2, lines 17, 18/, and  
a layer of dense closed-cell resilient foam material (2) /col. 2, lines 21 to 23 or 30, 31/; wherein  
the *substantially* rigid layer (1) includes  
a projecting boss (3) which, in use, is located in the region of the  
greater trochanter  
to increase the spacing between the outside of the rigid layer (1)  
and the greater trochanter /Figs/.

Legend (paragraph 2.2, 2.3):

underline = insertion, done by the examiner

strikeout = deletion, done by the examiner

italics = unclear term

2.3 The subject matter of claim 1 differs from this prior art by that  
the layer of dense, closed-cell resilient foam material (2) extends over a greater  
area than the *substantially* rigid layer (1), so that the periphery of the *substantially*  
rigid layer (1) lies entirely within the periphery of the layer of dense closed-cell

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resilient foam material ~~foam layer~~ (2).

- 2.4 The technical effect of this distinguishing feature is that the force is distributed over a greater area and / or the periphery of the substantially rigid layer cannot get in contact with the skin of the user.
- 2.5 Consequently the objective problem to be solved by this distinguishing feature may be regarded as to reduce the pressure onto the hip in case of an accident and / or to increase the comfort of the pad / avoid uncomfortable rubbing of the edge when moving.
- 2.6 D3, Figs. 1, 2 in combination with the abstract discloses to extend the comfort layer beyond the periphery of the layer shunting the impact force.
- 2.7 Thus, for a person skilled in the art, starting from the pad of D1 and wishing to improve the comfort of the pad, it would be an obvious possibility to employ the teaching of D3.  
In this way the person would arrive at the subject matter of claim 1 without performing an inventive step.
- 2.8 The examiner did not raise a novelty objection regarding claim 1 over D2, because he does not consider the dome-shaped shield of D2 to represent a boss / shield combination (see paragraph 4.4). However, the examiner would like to draw the attention of applicant to that this interpretation may be disputed.

**3. Dependent claims 2, 3, 5 to 11**

At least the dependent claims 2, 3, 5 to 11- at first glance - do not appear to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

- 3.1 D1, Figs. appears to disclose the additional features of dependent claims 2, 3.
- 3.2 The concept of distributing the impact on a bigger area is known by D3. To reiterate the concept as claimed in claims 5 and 6 is not regarded as to include an inventive step.
- 3.3 D3, Fig. 2 appears to disclose the additional features of dependent claim 7. To provide ventilation holes to improve evaporation of transpiration and to reduce

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transpiration is considered to be common knowledge to a skilled person.

- 3.4 To integrate hip pads in pockets or in a harness is equally general knowledge of a skilled person (see D4, D5). Consequently claims 8 to 11 do not appear to include an inventive step.

**4. Clarity**

- 4.1 It is clear from the Figs. and the description on page 3, lines 33, 34 as originally filed that the following - just by the examiner generally formulated - feature is essential to the definition of the invention:

The layer of dense closed-cell resilient foam material faces the concave side of the boss,

as otherwise the impact force is not cushioned / distributed.

Since independent claim 1 does not contain this feature, it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

- 4.2 The term 'substantially' used throughout the application and especially in the claims is vague and unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT), especially when considering p. 3, li. 3-11 to interpret the claims. It appears that not the layer itself is substantially rigid, but the layer consists of rigid material.
- 4.3 The term 'dense' used in claim 1 in the context of closed-cell resilient foam is vague and unclear, because there are no limits available to distinguish a dense and a not dense closed cell foam. Consequently the examiner has interpreted the property of the foam pretty wide.
- 4.4 The term "boss" is interpreted as signifying "any circular rounded protuberance on a shield (see Collins English Dictionary, ISBN 0-00472529-8, reprint 2002).

**5. Formal/Further Objections**

- 5.1 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate.
- 5.2 The features of the claim 1 are not consistently provided with reference signs

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placed in parentheses (Rule 6.2(b) PCT).

- 5.3 The document D1, which is considered to be the most relevant prior art document, is not identified in the description and its relevant contents is not indicated as required by Rule 5.1(a)(ii) PCT.

shields are typically installed in an undergarment in positions to cover the trochantheric regions.

#### SUMMARY OF THE INVENTION

According to a first aspect of this invention a pad  
5 for use in protecting the trochantheric region of the body comprises at least two separate layers; a substantially rigid layer, and a layer of dense, closed-cell resilient foam material, the substantially rigid layer including a  
10 projecting boss which, in use, is located in the region of the greater trochanter to increase the spacing between the outside of the rigid layer and the greater trochanter.

The projecting boss provides the first point of contact when a person wearing the pad falls sideways onto the ground. As a result of the boss providing the first  
15 point of contact the forces resulting from the fall can be dissipated, transferred and spread over the person's body in a controlled way to reduce the effect of the fall on the person. Preferably, the side walls of the projecting boss are substantially frusto-conical so that the base of the  
20 boss extends over a greater area than the top. The inclined side walls contribute to spreading the impact load received by the top of the boss sideways and outwards and so, in use, away from the region of the greater trochanter. Preferably the side walls are flared outwards at the base  
25 to merge into the remainder of the substantially rigid layer and join the top of the boss at a rounded corner.

The top of the boss may be thinner than the remainder of the rigid layer with the sidewall of the boss having a thickness corresponding to that of the remainder of the  
30 substantially rigid layer at its base and tapering to that of the top of the boss at its top. By configuring the boss in this way it is possible to provide a so-called "crumple zone" on the outermost part of the boss with the deformation of the crumple zone absorbing a significant  
35 amount of the impact energy of any fall. This combination of features enables the high impact pressure applied to the top of the boss to be dissipated into a lower pressure

spread over the remainder of the pad in a controlled way. The reduction in pressure reduces shear in the surrounding soft tissue and so reduces and substantially eliminates damage in this region.

5            Preferably a void is located beneath the boss either between the inside of the boss and the layer of foam, or beneath the layer of foam. This is especially important when the boss is configured to provide a crumple zone. The substantially rigid layer may be embedded in a closed cell  
10   foam material. In this case the closed cell foam material may be thinner on the outside of the top of the boss than on the remainder of the substantially rigid layer so that the boss is not apparent on merely looking at the external appearance of the pad. However, in this case, the presence  
15   of the boss can easily be located by feel which is useful for reasons which will be explained subsequently.

            The substantially rigid layer may be formed of metal, particularly a low density metal such as aluminium or an aluminium alloy but preferably it is formed from a plastics  
20   material and is produced by moulding, preferably injection moulding. Polypropylene is a convenient and reasonably cheap material which is generally suitable but plain or filled nylon, polyurethane and other so-called "engineering plastics" may be used particularly where it is required to  
25   configure the shape and performance characteristics of the boss to provide a crumple zone.

            Preferably, the layer of closed cell foam material extends over a greater area than the substantially rigid layer so that the periphery of the substantially rigid  
30   layer lies entirely within the periphery of the foam layer. Any pressure or impact load on the boss of the substantially rigid layer is dissipated throughout the remainder of the rigid layer up to the periphery and is then cushioned by the foam layer. In this way the impact  
35   load is spread over a considerably greater area and so does not cause significant damage to the underlying soft tissue. This is especially so at the periphery of the substantially

rigid layer since it is surrounded by the foam layer extending over a greater area. The foam layer may be formed from a closed cell, cross-linked low density polyethylene foam having a Shore hardness on the 00 scale  
5 of between 50 and 70 and preferably between 60 and 65.

The pad may include a third layer of less dense foam material remote from the substantially rigid layer. In this case it is preferred that the third layer has a greater extent than the layer of closed-cell foam and that the  
10 periphery of the layer of closed-cell foam lies wholly within the periphery of the third layer. The third layer further cushions and spreads any impact load. Equally since the periphery of the third layer extends outwards furthest and is the softest and thus most easily deformable, it  
15 merges into the shape and contour of the wearer's body so making the protective pad less obtrusive and providing wearing comfort.

Preferably, the third layer is formed of open cell foam material, such as PVC foam. Both foam layers may be  
20 formed from polyethylene or polyurethane but the closed cell foam may be formed from EVA. The or each foam layer preferably has a smooth outer appearance with edges that taper and merge into the wearer's body. Such tapering edges further enable pressure to be distributed in a controlled  
25 way to the body. The or each foam layer may be moulded, but it is simpler for the pieces to be die-cut from sheet material. The third layer may be formed from a conformable foam material. The rigid layer may be adhered to the closed cell foam layer and the closed cell foam layer adhered to  
30 the third layer. Of course when the substantially rigid layer is embedded within the closed cell foam layer adhesive is not usually required. Alternatively the rigid layer may be connected to the closed cell foam layer mechanically by stitching, stapling, riveting or use of a  
35 plastics connector.

The inside of the projecting boss may be partly filled with an additional layer of foam or a gel pad. This

CLAIMS

1. A pad for use in protecting the trochantheric region of the body comprises at least two separate layers, a substantially rigid layer (1), and a layer of dense, closed-cell resilient foam material (2); wherein the substantially rigid layer (1) includes a projecting boss (3) which, in use, is located in the region of the greater trochanter to increase the spacing between the outside of the rigid layer (1) and the greater trochanter.
2. A pad according to claim 1, in which the side walls of the projecting boss (3) are substantially frusto-conical so that the base of the boss (3) extends over a greater area than the top (11).
3. A pad according to claim 2, in which the side walls of the boss (3) are flared outwards at the base to merge into the remainder of the substantially rigid layer (1) and join the top of the boss (11) at a rounded corner.
4. A pad according to any one of the preceding claims, in which the top of the boss (3) is thinner than the remainder of the rigid layer (1) with the sidewall of the boss having a thickness corresponding to that of the remainder of the substantially rigid layer (1) at its base and tapering to that of the top of the boss (11) at its top.
5. A pad according to any of the preceding claims, in which the layer of closed-cell foam material (2) extends over a greater area than the substantially rigid layer (1) so that the periphery of the substantially rigid layer (1) lies entirely within the periphery of the foam layer (2).
6. A pad according to any one of the preceding claims, in which the pad includes a third layer (10) of less dense foam material remote from the substantially rigid layer.
7. A pad according to claim 6, in which the third layer (10) has a greater extent than the layer of closed-cell foam (2) and that the periphery of the layer of closed-cell foam (2) lies wholly within the periphery of the third layer (10).

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8. A pad according to any one of the preceding claims, in which apertures (7) are provided through at least the rigid (1) and closed cell foam (2) layers of a pad to provide for ventilation.
- 5 9. A protection device for covering the trochantheric region of the body includes two protective pads (22) in accordance with any one of the preceding claims, connected to a support (20,21,23,27) so that, in use, the pads cover the trochantheric regions of the user of the protection
- 10 device.
10. A protection device according to claim 9, in which the support has the form of a garment which covers the trochantheric area.
11. A protection device according to claim 10, in which
- 15 the garment has the form of an undergarment (23,27) having a waistband (24,28) and being arranged, in use, to extend down the thighs of the wearer.
12. A protective device according to claim 10 or 11, in which the garment (25,27) includes pockets (30) which hold
- 20 the pads (22).